

THE CLAIMS

What is claimed is:

1. A device preparation of a whipped food, comprising:
a container portion containing a food component and configured for receiving
5 a fluid for mixing with the food component to produce a fluid mixture;
a foam conditioning conduit associated with the container portion for
receiving the fluid mixture therefrom with gas bubbles entrained therein to produce a fluid
food product, the conduit comprising:
a restriction channel associated with the container portion downstream
10 thereof to receive the food product, the restriction channel being configured for conditioning
the bubbles into a foam and having a cross-section sufficiently small and sufficient length for
selectively feeding bubbles in the food product that are smaller than a preselected maximum
bubble size,
a deceleration channel in fluid communication with the restriction
15 channel downstream thereof to receive the food product therefrom, the deceleration channel
configured to substantially reduce the flow speed of the food product, and
an outlet downstream of and in fluid communication with the
deceleration channel to dispense the slowed flow of food product.
- 20 2. The device of claim 1, wherein the restriction channel is configured for
shearing the flow for producing the bubbles below the maximum size and whipping the food
product and bubbles to produce a whipped food product.
- 25 3. The device of claim 1, wherein the food product is a beverage.
4. The device of claim 1, wherein the food component includes a coffee,
tea, milk, or soup product, or a combination thereof.
5. The device of claim 1, wherein the deceleration channel is configured
30 for substantially reducing or preventing the rupturing of the bubbles flowing therethrough.
6. The device of claim 1, wherein the maximum bubble size corresponds
to a maximum bubble mass of each bubble, and the deceleration channel is configured for
substantially maintaining the individual bubble mass from the restriction channel.

7. The device of claim 1, wherein the deceleration channel is configured to slow the flow sufficiently for dispensing from the outlet at a speed sufficiently low to substantially generally retain the conditioning of the foam in the food product.

5 8. The device of claim 7, wherein the deceleration channel is configured to slow the flow sufficiently for dispensing from the outlet at a speed sufficiently low to substantially reduce or prevent the rupturing of the bubbles.

9. The device of claim 1, wherein the container portion contains the gas and is configured for receiving an injection of the fluid and mixing the gas as bubbles into the mixture of the food component and fluid.

10 10. The device of claim 1, wherein the gas is introduced into the foam conditioning conduit upstream of the restriction channel.

15 11. The device of claim 10, wherein the package is configured such that at least about 75% of the gas that is dispensed through the outlet is fed through the restriction channel.

20 12. The device of claim 1, wherein the foam conditioning conduit is free of an air inlet downstream of the restriction channel.

13. The device of claim 1, wherein the restriction channel has a cross-sectional area of between 0.01 mm^2 and 3 mm^2 .

25 14. The device of claim 1, wherein the deceleration channel has a total cross-sectional adjacent the outlet of between about 0.05 mm^2 and 100 mm^2 .

15. The device of claim 1, wherein the restriction channel has a length of at least about 20 times a largest cross-sectional dimension thereof.

30 16. The device of claim 1, wherein the length of the restriction channel is between about 5 mm and 50 mm.

17. The device of claim 1, wherein the deceleration channel is configured for reducing the flow speed to between 1:5 and 1:100 of the maximum speed of the flow through the restriction channel.

5 18. The device of claim 1, wherein the deceleration channel has a cross-section with an aspect ratio of between about 1:5 and 1:50.

19. The device of claim 1, wherein the deceleration channel comprises a plurality of deceleration sub-channels that have a combined cross-sectional area sufficiently
10 larger than the restriction channel for substantially decelerating the flow.

20. The device of claim 1, further comprising a package that comprises the container portion and the foam conditioning conduit, the package configured for operative association with an extraction device for feeding the fluid under pressure into the container
15 portion.

21. The device of claim 20, further comprising a closure associated with the container portion for enclosing the food component therein, the foam conditioning conduit extending through the closure.

20 22. The device of claim 21, wherein the closure comprises at least two wall portions between which the channels are defined.

23. The device of claim 22, wherein a first one of the walls defines a
25 groove, and a second one of the walls comprises a foil sealed to the first wall for cooperatively defining at least a portion of the channels therebetween.

24. The device of claim 21, wherein:
the closure comprises a seal that seals the foam conditioning conduit from the
30 food component in the container portion,
the device further comprising an opening mechanism operably associated with the seal for opening the seal in response to an elevated fluid pressure within the container portion for fluidly communicating the container portion with the conditioning conduit for feeding the fluid mixture into the conduit.

25. The device of claim 24, wherein the opening mechanism comprises a piercing member disposed with respect to the seal such that, when the pressure reaches a predetermined value inside the container portion, the seal and piercing member are biased into a piercing association in which the piercing member pierces the seal to fluidly communicate the container portion with the foam conditioning conduit.

26. A device for preparation of a whipped food, comprising:
a container portion containing a food component and configured for receiving a fluid for mixing with the food component to produce a fluid food product;

a foam conditioning conduit associated with the container portion for receiving the food product from the container portion and also a gas such that the food product includes bubbles of the gas, the conduit comprising a foaming channel comprising:

a restriction channel in fluid association with the container portion downstream thereof to receive the food product with the gas bubbles, the restriction channel having a cross-section sufficiently small and sufficient length for feeding bubbles that are smaller than a preselected maximum bubble size,

a deceleration channel in fluid association with the restriction channel and downstream thereof to receive the food product and bubbles from the restriction channel, the deceleration channel configured to substantially reduce the flow speed of the food product and bubbles, and

an outlet downstream in fluid association with the deceleration channel to outlet the slowed flow of food product and bubbles for dispensing.

27. A package for preparation of a food, comprising:

a container portion containing a food component and configured for receiving a fluid under pressure for mixing with the food component to produce a fluid food product;

a seal sealing the container portion;

an opening mechanism comprising a piercing member associated with the seal, such that when the pressure reaches a predetermined opening pressure, the opening pressure acts against and biases the seal towards the piercing member such that the piercing member pierces the seal to open the seal for releasing the mixed fluid and food component from the container portion.

28. The package of claim 27, further comprising an outlet extending generally radially with respect to the piercing member and configured for dispensing the mixed fluid and food product from the container portion when the seal is opened by the opening mechanism.

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29. The package of claim 27, wherein the seal comprises a foil.

30. A method for preparing a whipped food, comprising:

10 injecting high pressure fluid into a container portion for mixing with a food component and a gas to provide a food product;

feeding the food product from the container portion under pressure through a restriction channel that has a sufficiently small cross-section and sufficient length for feeding bubbles in the food product that are smaller than a preselected maximum bubble size for conditioning a foam in the food product;

15 feeding the food product from the restriction channel through a deceleration channel to substantially reduce the flow speed of the food product and bubbles; and

dispensing the food product at a speed that is sufficiently low to substantially reduce or prevent splashing to substantially retain the conditioning of the foam.